SEP 21 '79
CALIF.

FIRST CLASS MAIL

PRINTED MATTER

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PRINTED MATTER

FIRST CLASS MAIL

Sep '79

MD 50

A NEW DIMENSION IN MECHANICAL DESIGNING

I Corporation

THE MD 50 WAY

is a faster easier and more accurate way to produce:

- **Part drawings**
- **Assembly drawings**
- **Technical illustrations**
- **Architectural drawings**
- **Numeral control tapes**
- **Design studies**
- **All conic sections**
- **Polygons**
- **Textured fills**
- **Optional digitizing tablet entry**
- **Floppy-disc based for speed**
- **Library 1000's of operator designs**
- **Polar and rectangular-coordinate manipulation**
- **Labeling and dimensioning**

New CAD system offered by I Corporation eliminates tedium of much design and drafting. Working as accurately as a job demands—up to fourteen digits—the operator may ask the system to place holes, lines, or conic sections, and to step and repeat around a point (circle) or up and down (linearly).

All elements contained in MD-50 can be used to construct named objects for storage in a library. Then when called for the objects can be scaled, mirrored, or rotated—again to an available fourteen digits of accuracy. An added facility is a pan-and-zoom around any retrieved or newly created design. And any area can be filled with standard cross-hatching, or even special textures created by the operator-designer.
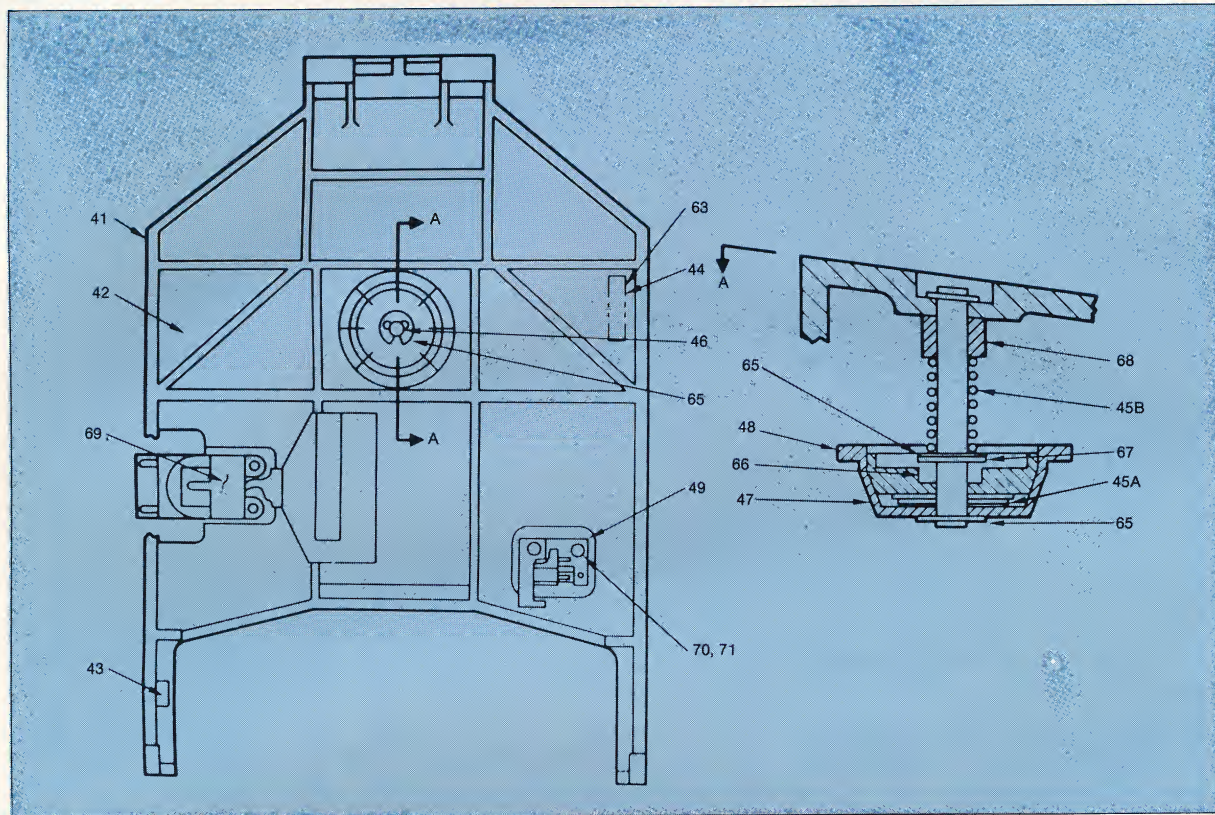
The availability to design with rectangular or polar coordinates is incredibly powerful. A series of holes, for example, may be entered with reference to one corner of a plate—in rectangular coordinates, of course—and then the system can be simply asked to give precisely the angle between any two holes! Limited refresh graphics can be made for rotation or translation. The MD-50 Mechanical Design Package by I Corporation is truly remarkable.

MD50 Features

- **System power.** MD 50 reduces errors, makes revisions easily, produces substantial amounts of a drawing automatically.

- **Capabilities you have been looking for.** Build designs on the CRT. Revise Quickly. Store designs on flexible disc. Output art on the plotter.

- **Significant time savings.** Complete mechanical designs in a fraction of the time spent on manual drawing.

- **Accurate results.** Up to 14 digits provides the accuracy of the most demanding machine tool or plotter.

- **A tool for designers.** MD 50 is easy to use. You are not required to become a programmer or computer expert. The system asks questions—you supply the answers.

Design and Draw with MD 50

Drawing accuracy is automatic. When you draw a line, its length is accurate to 14 places. All your work is always to scale. Eliminate design errors due to "approximate" constructions or non-scale layouts and still produce the drawing faster.

MD 50 is library oriented to speed your designing. Make an assembly drawing quickly by recalling the pieces parts from the library. You can call up any previous work and add it to a new drawing. Objects from the library can be positioned, rotated, mirrored, and scaled as desired. Don't repeat similar work—just call up the previous version and modify it.

Let the computer do the tedious work while you do the designing. Repetitive elements can be produced automatically. For instance, to create an eight spoked wheel, you would draw one spoke and let MD 50 duplicate it rotated in 45 degrees increments. For symetrical parts, let the computer construct the mirror image. Step and repeat of any elements can be done in any direction. Let MD 50 put in shading, crosshatching or textured fills of any type. Repetitive tasks should be performed by a computer while you concentrate on creative design.

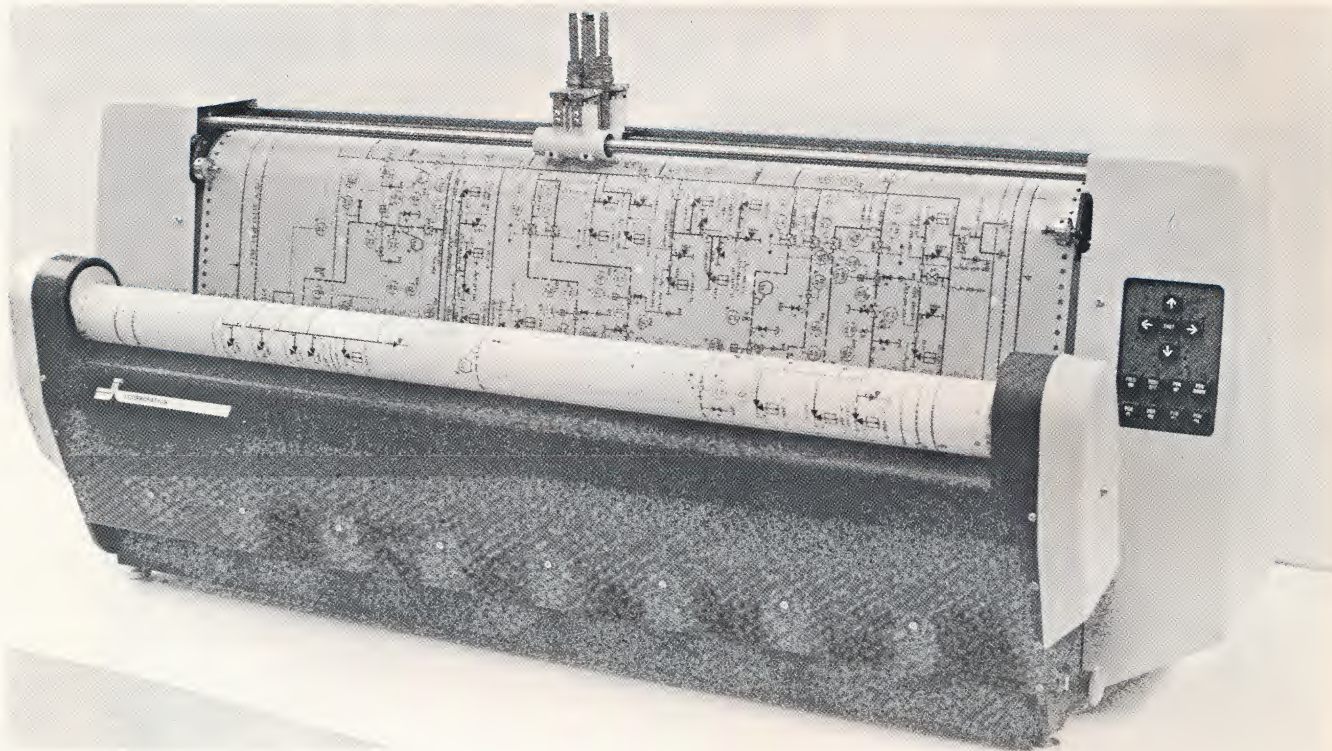**Designing is easier.** Create your designs in a natural way. As you locate elements, you can work relative to any point in either polar or orthoganal coordinates and in any units, English or metric. You can continue to change references as you stack up elements so that you always are using the dimension of interest. When you are done, select the datum point and let the computer tell you the dimensions.

Zoom or change scale at any time. Select convenient drawing scales to work on dense designs. Zoom to specified locations; work anywhere on an E sized or larger format. Complete finely detailed work fast. Later, output your layout on the plotter at a drawing scale you select.

What happens if I change my drawing or make a mistake? MD 50 provides you with extensive editing facilities to revise designs from computer memory. Selectively erase, redraw, or overlay drawings. A special "draw-around" feature lets you capture and manipulate an entire section of your drawing as a discrete entity. Draw a line around any portion using joystick input. Treat the enclosed structures as a single object.

MD 50 has powerful curve drawing capability. Specify the curve you want—circles, arcs, ellipses, hyperbolas, parabolas—any conic section. See it in refresh and modify it before it is drawn. Specify a curve by radius and included angle or tangent to three points. Let the computer put in the fillets.

I Corporation model 3700 large bed & pen plotter. Output very large drawings (34" wide x 10' long) with MD 50 and other I Corporation graphic systems.

MD50 Benefits Extend Beyond Drawing Completion

Save weeks of time on every project. Producing drawings quickly is just a small part of the savings MD50 provides. The design checking features reduce expensive errors, makes your drawings right the first time. Revisions are easier and faster. The increased drawing accuracy and elimination of drafting short cuts pays dividends every time the drawing is used in production.

Secure data storage eliminates missing information. Store your drawings on flexible disc. Every rev level can be stored seperately so you can easily trace changes. Magnetic storage is efficient and reliable.

Design checking is more accurate. Use the MD50 features to eliminate mistakes. Display a hinged part from the library and rotate it around its pivot point to see if it has proper clearance. Call up piece parts and overlay them to check for hole location. Assemble parts together on the screen and check for compatibility.

MD50 is easy to operate. The MD50 system provides an interactive automated tool combining human skills and intelligence with computer processing power. You supply the design skills—MD50 supplies the processing power. To orient new users, a comprehensive instruction manual includes four tutorial chapters featuring on-line instructional experience. Take the easy, natural step from manual to automated methods. You are not required to become a computer programmer.

Systems Hardware

MD50 system hardware provides optimum computing performances. MD50 is designed to run on the Tektronix 4051 Graphic System configured with 32 kilobytes of operating memory, and I Corporation joystick, plotter, rom pack and dual flexible disc system.

Optional digitizing capability speeds throughput. A 36' by 48' digitizing tablet can be used to input existing data quickly and to speed work on very large drawings.

Between designs, your MD50 system hardware is capable of performing a broad range of data-processing tasks. The system includes a powerful graphic computer that is easily programmed in BASIC. Whether you run business, scientific, or engineering applications, MD50's system hardware is available to meet your needs.

System Economics

The MD50 System pays for itself in a few months. MD50 generates accurate drawings 2 to 10 times faster than manual methods. Documentation is automatically generated. MD50 eliminates days of time on every project.

Terms and Conditions

Delivery . . . . 30 days
Shipping . . . . F.O.B. Berkeley, CA
Terms . . . . Net 30 days

I Corporation

735 Addison Street • Berkeley, California 94710 • Telephone (415) 848-6600

SC 50

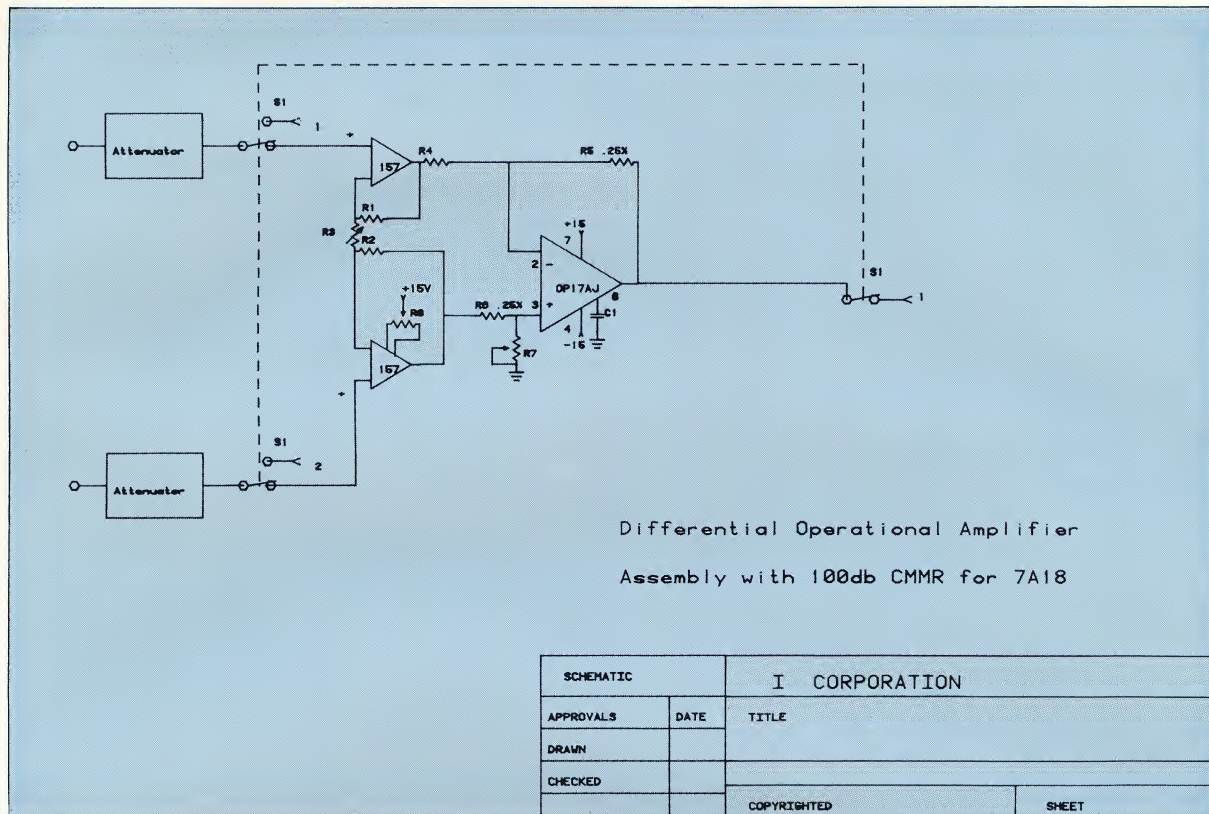## CREATE SCHEMATICS IN MINUTES THE SC 50 WAY

THE SC50 WAY

- **■ SCHEMATICS**
- **■ FLOWCHARTS**
- **■ PERT CHARTS**
- **■ SELF JUSTIFYING TEXT**
- **■ BILL OF MATERIALS**
- **■ SORT BY COMPONENT VALUE**
- **■ SORT BY YOUR PART NUMBER**

SC50 Features

■ **System power.** SC50's powerful software runs interactively on the Tektronix 4051 Graphic System.

■ **Capabilities you have been looking for.** Build schematics on the 4051's CRT. Produce schematics to 99 × 99 inches. Revise quickly. Store designs on magnetic tape or flexible disc. Output art on the Tektronix 4662 plotter.

■ **Significant time savings.** Complete schematics in one-third to one-tenth the time spent on manual drawing. Generate documentation from schematics.

■ **Accurate results.** Automatically position symbols at any point you specify. Output on the Model 4662 plotter is repeatable to 0.0025 inches.

■ **A tool for designers.** SC50 is easy to use. You are not required to become a programmer or computer expert. The system asks questions—you supply the answers.

Design and Draw with SC 50

Differential Operational Amplifier

Assembly with 100db CMMR for 7A18

Typical X-Y plotter output on the 4662 Plotter. This plotter provides high quality 11″ × 17″ drawings using felt tip or technical pens. The extraordinary accuracy of this plotter makes possible smaller drawing formats than are practical with manual drafting methods.

Tailor the SC50 component library to meet your specific needs. SC50 provides you with a library or data base of 50 IEEE ANSI symbols meeting military specifications. Add your own selection of frequently used symbols to the data base. Save and label simple patterns or more complex structures like commonly used circuits. You specify orientation and sizes of symbols. Your data base size is limited only by the availability of magnetic tapes or flexible discs.

One picture is worth a lot of drafting. Once the data base is complete, elements are called, oriented, positioned with a joystick, and displayed on the 4051's CRT. You never reconstruct schematic elements stored in your component library.

Repetitively used objects are automatically duplicated in a step-and-repeat fashion. For instance, a JK-flip flop with connections can be quickly drawn and duplicated 15 times horizontally to form a logic bank. Simply duplicate this entire structure many times vertically to create a large system. Repetitive tasks are performed by the computer while you concentrate upon creative aspects of your design.

Zoom or change scale at any time. Select convenient drawing scales to work on dense schematics. Zoom to specified locations; complete finely detailed work fast. Later, output your layout on the plotter at a drawing scale you select.

What happens if I change my schematic or make a mistake? SC50 provides you with extensive editing facilities to revise Schematics from computer memory. Selectively erase, redraw, or overlay schematics. A special "draw-around" feature lets you capture and manipulate an entire section of schematics as a discrete entity. Draw a line around any group of components or circuits using joystick input. Treat the enclosed structures as a single object.

Produce consistently accurate schematics. Eliminate positioning errors prior to plotting; SC50 automatically locates symbols exactly on the points you specify. Store your schematics safely as precise mathematical maps. Recall schematics accurately any time for reference, revision, or enhancement. The Tektronix 4662 plotter is repeatable to ± 0.0025 inches, and SC50 includes a plotter calibration procedure assuring a high degree of accuracy on all plotters.

SC50 Benefits Extend Beyond Schematic Completion

Save weeks of time on every project. Producing schematics and documentation quickly is just part of the "SC50 WAY". Time is not lost while waiting for drawing release, photo-reduction, or revision. Expect to eliminate up to 2 or 4 days of lead time on each project.

Secure data storage eliminates the missing schematic. Use magnetic tape or flexible disc to store data accurately and efficiently. Eliminate frustrating searches to find and replace missing revisions. Ship inked plotter output, magnetic tape, or flexible disc instead of originals.

SC50 is easy to operate. The SC50 system provides an interactive automated tool combining human skills and intelligence with computer processing power. You supply the circuit design skills—SC50 supplies the processing power. To orient new users, a comprehensive instruction manual includes four tutorial chapters featuring on-line instructional experience. Take the easy, natural step from manual to automated methods. You are not required to become a computer programmer.

Systems Hardware

SC50 system hardware provides optimum computing performances. SC50 is designed to run on the Tektronix 4051 Graphic System configured with 32 kilobytes of operating memory, a joystick, and plotter. You can double SC50's speed by adding I Corporation's Model 3200A dual flexible disc system to your configuration.

Between schematics, your SC50 system hardware is capable of performing a broad range of data-processing tasks. The Tektronix 4051 is a powerful graphic computer that is easily programmed in BASIC. Whether you run business, scientific, or engineering applications, SC50's system hardware is available to meet your needs.

Create and sort bills of material

After creating a schematic and labeling the components with reference designations and comments (up to 72 characters per label), a bill of material may be automatically created with a special SC50 program overlay. Furthermore, the created bill of material may be easily edited on the SC50 system and sent to a high-speed printer, host (computer) inventory system or plotter.

The SC50 also provides the tools to make secondary lists in which parts are sorted by component values, manufacturer part numbers or your own in-house part numbers.

Resistors				
R1	10 K	5%	¼ watt	#105250
R2	.5 K	10%	½ watt	#005500
R3	10 ohm	10%	1 watt	#000.111000
Capacitors				
C1	5 mmf		Tantalum	#60052
C2	2.5 E-6 mf		Ceramic	#6000254

System Economics

The SC50 System pays for itself in months. SC50 generates accurate schematics 3 to 10 times faster than manual methods. Documentation is automatically generated. SC50 eliminates days of time on every project.

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I CORPORATION

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THE PC 50 WAY

- **LAYOUTS**
- **GROUND PLANES**
- **DRILLING DRAWINGS**
- **SILKSCREEN ART**
- **SOLDER MASK ART**
- **FABRICATION DRAWINGS**
- **ASSEMBLY DRAWINGS**

PC 50 Features

- **System Power . . .** PC 50's powerful software runs interactively on the Tektronix 4051 Graphic System.

- **Capabilities you have been looking for . . .** Build double sided or multilayer PCB's on the 4051's CRT . . . produce high density layouts up to 50 x 50 inches . . . revise layouts quickly . . . store designs on magnetic tape or flexible disk . . . output camera ready art on the plotter.

- **Significant Time Savings . . .** Complete layouts in one-third to one-tenth the time spent on manual tape-ups . . . generate documentation from layout data.

- **Accurate Results . . .** automatically position component pad sets at any point you specify . . . output on the Tektronix 4662 plotter is repeatable to 0.0025 inches.

- **PC Board Prototypes in a Single Day . . .** Generate double sided prototypes in minutes . . . output layout directly on copper clad PCB stock . . . use etch resist ink pens and plotter to prepare your board for etching and drilling.

- **A Tool for PCB Designers . . .** PC 50 is easy to use . . . you are not required to become a programmer or computer expert . . . the system asks questions; you supply the answers.

Design and Layout With PC 50

Tailor the PC 50 component library to meet your specific needs . . . PC 50 provides you with a library or data base of standard components like 90° radius corners, doglegs and DIP pad sets. Add your own selection of frequently used PCB elements to the data base. Save and label simple DIP patterns or more complex structures like commonly used circuits. You specify the width of traces, doglegs, or round corners plus the sizes of square or octagonal or round pads. Your data base size is limited only by the availability of magnetic tapes or flexible discs.

One picture is worth a lot of tape-up. Once the data base is complete, PCB elements are called, oriented, positioned with a joystick, and displayed on the 4051's CRT. You never reconstruct PC board elements stored in your component library.
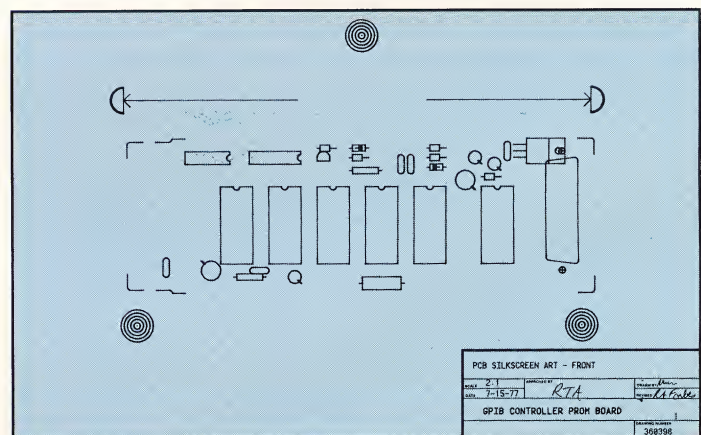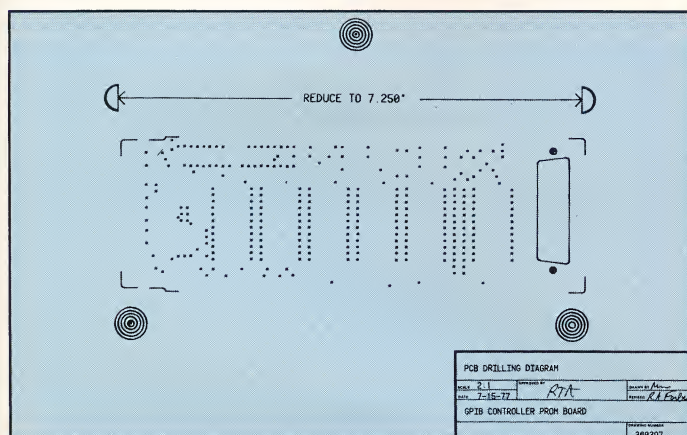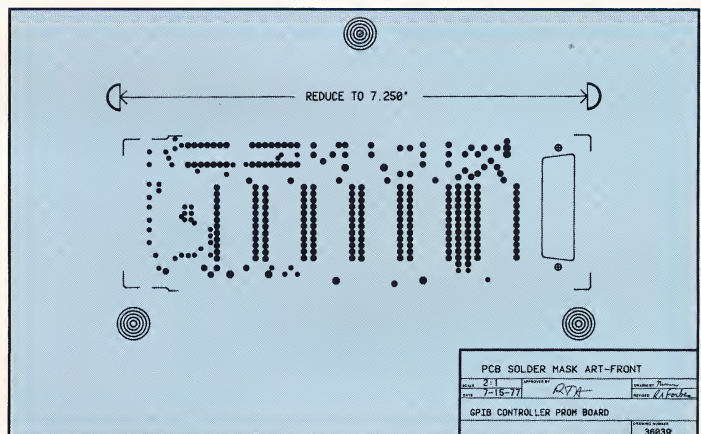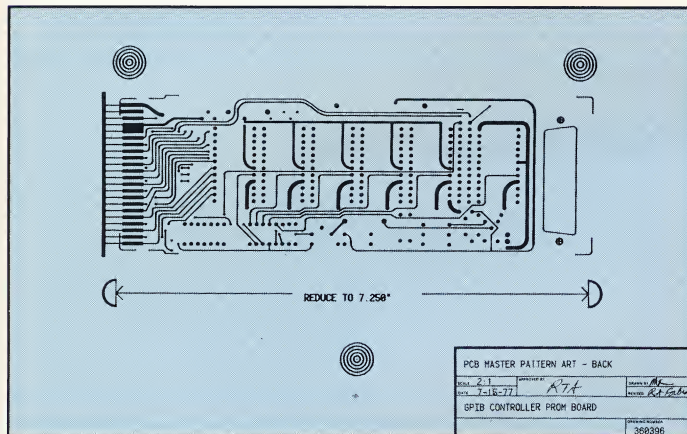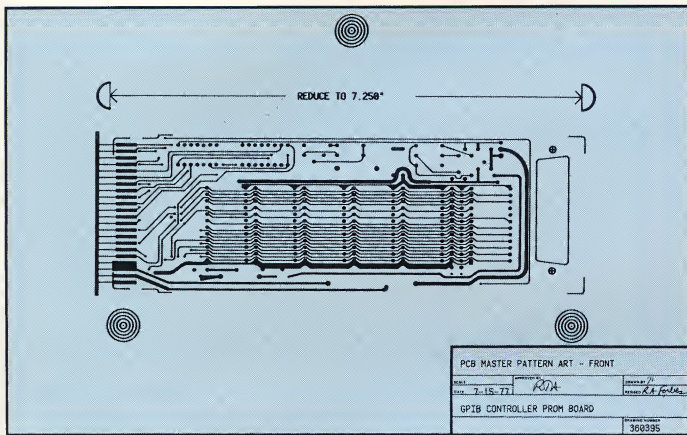
Repetitively used objects are automatically duplicated in a step and repeat fashion. For instance, a 4 K RAM DIP pad set with connections can be quickly drawn and duplicated 15 times horizontally to form a 4 K x 16 memory bank. Simply duplicate this entire structure 7 times vertically to create a 32 K byte memory plane. Repetitive tasks are performed by the computer while you concentrate upon creative aspects of your design.

Zoom or change scale at any time . . . Select convenient drawing scales to work on densely populated PC boards. Zoom to specified locations; complete finely detailed work fast. Later, output your layout on the plotter at any drawing scale you select.

What happens if I change my layout or make a mistake? PC 50 provides you with extensive editing facilities to revise PCB layouts from computer memory. Selectively erase, redraw, or overlay PCB elements. A special "draw-around" feature lets you capture and manipulate an entire section of a layout as a discrete entity. Draw a line around any group of components or circuits using joystick input. Treat the enclosed structures as a single component.

Produce consistently accurate layouts . . . Eliminate positioning errors prior to plotting. PC 50 automatically locates pad sets exactly on the points you specify. Store your layouts safely as precise mathematical maps. Recall PC layouts accurately at any time for reference, revision, or enhancement. PC 50 includes a plotter calibration procedure assuring a high degree of accuracy on all plotters.
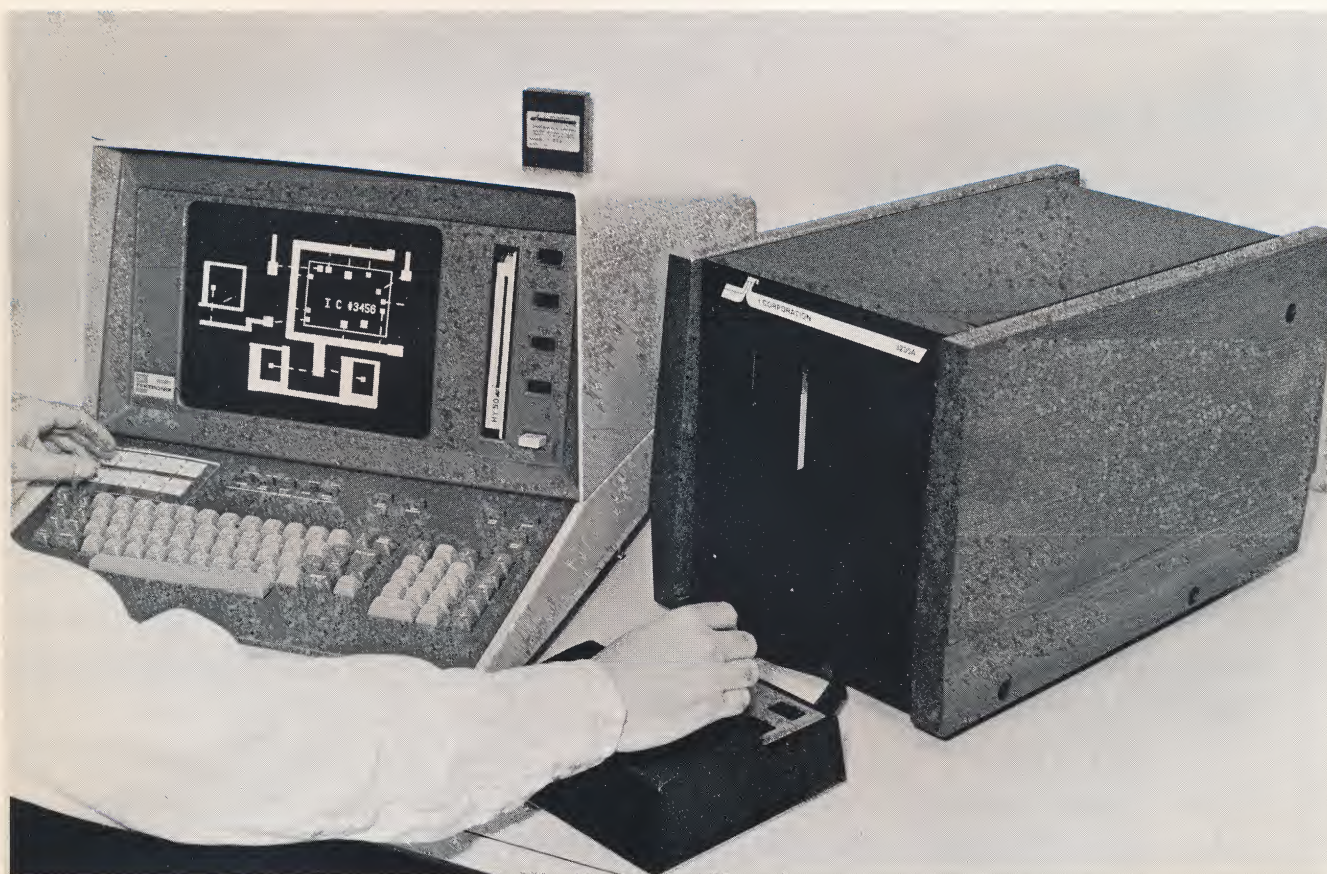
PCB MASTER PATTERN ART - FRONT
7-15-77 RTA R.A.Foster
GPIB CONTROLLER PROM BOARD
360395

PCB MASTER PATTERN ART - BACK
7-15-77 RTA
GPIB CONTROLLER PROM BOARD
360396

PCB SOLDER MASK ART-FRONT
7-15-77 RTA R.A.Foster
GPIB CONTROLLER PROM BOARD
360397

PCB DRILLING DIAGRAM
7-15-77 RTA R.A.Foster
GPIB CONTROLLER PROM BOARD
360397

PCB SILKSCREEN ART - FRONT
7-15-77 RTA R.A.Foster
GPIB CONTROLLER PROM BOARD
360398

Sep '79

HY50

COMPUTER—AIDED HYBRID DESIGN

HY50—
THE STATE OF THE ART

- **Design the largest, most complex hybrids.**
- **Automatic, multi-mode resistor sizing.**
- **Tedious work done by computer.**
- **Auto-bonder output.**
- **Complete documentation generated.**

HY50 Features

- **Powerful Design Aids** . . . Design on a CRT . . . move whole groups of elements . . . call up circuits from your library . . . revise quickly . . . store design on floppy disc . . . output camera ready art and related drawings on plotter.

- **Produce better, more accurate designs** . . . specify positions as accurately as 0.00001″ . . . Plotter accuracy of 0.002″ over 36″ provides significantly improved art.

- **Nearly unlimited system capability** . . . 1000's of seperable levels (mask layers) . . . up to 10″ x 10″ designs at 1:1 . . . 1000's of library structures per diskette . . . metric or English units . . . accepts your own custom algorithms for resisters.

- **Major time savings** . . . Complete designs two to ten times faster . . . make major revisions in a fraction of the time now spent.

- **Easy operation** . . . You think of the design and let the computer do the drafting . . . no computer expertise required . . . just answer questions and push buttons labeled scale, redraw, etc.

- **Optional separate heat analysis package** . . . Simulate heat distribution on your hybrid before you try prototyping or production.

Design and Draw with HY50

Input. HY50 lets you define design elements in the most convenient way. You can use the joystick (or optional 3' x 4' tablet) to point to approximate locations on the display. The computer will adjust the position to be exactly on the grid you have chosen. You can change and mix grids. You can enter locations from the keyboard. You can quickly trace or create a design on a digitizing tablet. The layout is a precise mathematical map accurate to 14 decimal places. HY50 eliminates all the tedious, painstaking measuring and placement on grids that manual light table drafting requires.

Don't do the same work twice. HY50 is library oriented. You build a library of your standard structures naturally, adding to it with every design. The library holds more than resistors, IC dice etc; it also has many groups of elements that you thought would be useful. You can call up any of your designs and select any portion to be put in the library. Position any library structure anywhere, rotate it, edit it, erase it, move it; eliminate laying out the same thing more than once.

Let the computer do the tedious work. HY50 will step and repeat any repetitive pattern. You select a structure on the display and the computer duplicates it at the desired locations. Do you ever get half way through a design and wish you could move a big piece of it but it's just too tedious and time-consuming? HY50 makes it easy.
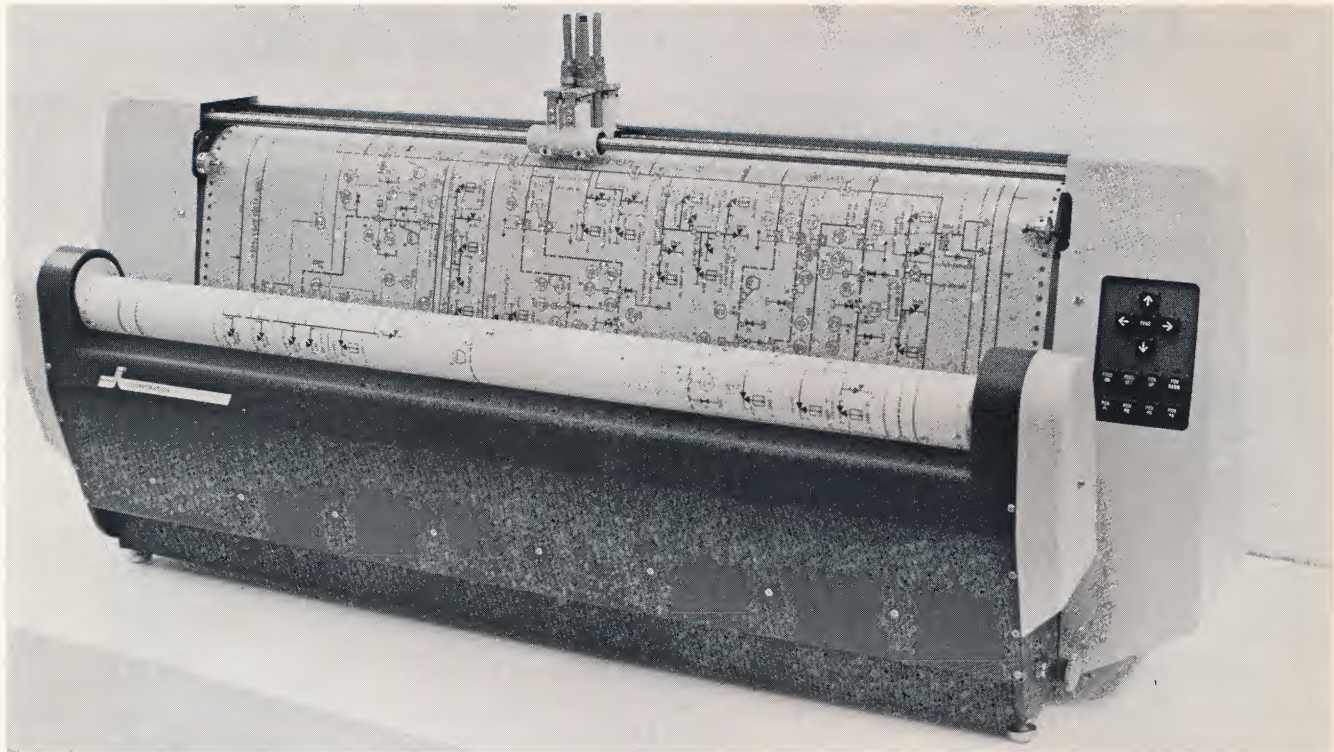
Automatically create resist areas. HY50 allows you to specify up to 10 different paste-resistivities. You will select the resistance value and specify an area limit and the program will choose the appropriate paste and optimum area to be covered.

Customized Algorithms. The HY50 routine is user-modifiable so as to support your own specific needs. The program provides definable functions for resistivity or capacitance. You can insert your own algorithms for resistivity and capacitance directly into the program.

Tailor the HY50 component library to meet your specific needs. The program allows you to create a library or data base of up to 8000 components or user-defined elements, per disc. Save and lable simple patterns or more complex structures like commonly used circuitry elements. Your data base size is limited only by the availability of flexible discs. Erase and edit by named object.

One picture is worth a lot of drafting. Once the object data base is complete, elements can be called up, positioned anywhere on the screen with a joystick and rotated. You need never reconstruct these elements once they are in your library.

I Corporation model 3700 large bed 4 pen plotter. Output very large drawings (34" wide x 10' long) with HY50 and other I Corporation graphic systems.

HY50 Benefits Extend Beyond Completion of the Layout

Save weeks of time on every project. Producing hybrids and documentation quickly is just part of the HY50 system. Time is not lost while waiting for drawing release, photo-reduction, or revision. Expect to eliminate several days of lead time on each release and revision.

Secure data storage eliminates the missing layout. Use magnatic tape or flexible disc to store data accurately and efficiently. Eliminate frustrating searches to find and replace missing revisions. Save system outputs on magnetic tape or flexible disk rather than originals using tape and vellum.

HY50 is easy to opperate. The HY50 system provides an interactive automated tool combining human skills and intelligence with computer processing power. You supply the circuit design skills—HY50 supplies the processing power. To orient new users, a comprehensive instruction manual features on-line instructional experience. Take the easy, natural step from manual to automated methods. You are not required to become a computer programer.

Everyone can afford HY50. HY50 multiplies the efforts of your best designers several times yet a typical system costs less than $30,000 including plotter. You'll pay for the system in much less than a year just on direct labor-savings. Even bigger savings will come from the lead time saved in every project, the ease of revision, the reduction of errors and the more accurate outputs. HY50 will keep you up with the state of art.

The I Corporation CAD System. The HY50 sofeware package runs in the powerful CAD system developed by I Corporation which includes a Tektronix 4051 Graphic System, Max 2000 32K Byte memory, Model 2005 Joystick, Model 2903 EE Drafting ROM Pack, and Model 3200A Dual Floppy Disc. Most users choose I Corporations 3700 Drum Plotter, however output is available to drive all standard plotters including photo plotters and ruby lith cutters. Options include a 36" x 48" digitizing tablet, a hard copy unit for instant pictures of the display, off-line plotting and auto bonder tapes. Other I Corporation software can be used with this CAD system for printed circuit board layout, schematic layout and mechanical drawings. All of your drafting can be done on this system, even tasks like graphs, technical illustrations and forms design.

System Economics

The HY50 System pays for itself in a few months. HY50 generates an accurate drawing 2 to 10 times faster than manual methods. Documentation is automatically generated.

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